FIVE YEAR
REVIEW REPORT (TYPE 1)

GEIGER (C&M OIL) SITE
RANTOWLES, SOUTH CAROLINA

OCTOBER 1998

PREPARED BY
U. S. ENVIRONMENTAL PROTECTION AGENCY
WASTE MANAGEMENT DIVISION
REGION 4

1.0 INTRODUCTION

EPA Region IV conducted this review pursuant to CERCLA Section 121(c),NCP Section 300.400(f)(4)(ii), and OSWER Directives 9355.7-02 (dated May 23, 1991), and 9355.7-02A (dated July 26, 1994). This review is required by statute and is the first five-year review. The purpose of a five-year review is to ensure that a remedial action remains protective of human health and the environment and is functioning as designed. This document will become a part of the Site file.

1.1 Site Location and Description

The Geiger (C & M Oil) Site (the Site) is located along Highway 162 in Rantowles, Charleston County, South Carolina, approximately ten (10) miles west of the City of Charleston. The Site is in a sparsely populated rural area. Approximately ten (10) residences are located near the Site to the east and northeast. The area is serviced by municipal water, though there are two private wells located upgradient of the site. The population in the immediate Site area is estimated at forty (40) people. Several small businesses are located within a half (0.5) mile of the Site along Highway 162. The property covers a five (5) acre area of very little topographic relief, however, the Site area is approximately one and one-half (1.5) acres in size. This affected area is triangular in shape and is bounded on two sides by ponds, and on the third side by a small rise, approximately five (5) feet higher than the Site area. Elevations on the Site range from approximately fifteen (15) to thirty (30) feet above mean sea level.

1.2 Site Characteristics

The Geiger Site is located in the Atlantic Coastal Plain Physiographic Province of South Carolina. The uppermost aquifer at the site is a surficial, unconfined aquifer, approximately 40 to 50 feet thick, composed of clean to silty fine to medium sand with some clay lenses. Depth to groundwater varies seasonally and is approximately three feet below land surface. The surficial aquifer is underlain by the Cooper Marl, which acts as a confining layer.

All groundwater in South Carolina is classified as Class GB Waters (South Carolina Regulation 61-68). This classification means that all groundwater meeting the definition of underground sources of drinking water (USDW) meet quality standards set forth in the State Primary Drinking Water Regulations (R.61-58.5). An USDW is defined as an aquifer or portion of an aquifer which supplies or contains sufficient quantity of water to supply a public supply system.

1.3 Site History

In March 1969, the South Carolina Pollution Control Authority (SCPCA) permitted Adams Run Services, Inc. to incinerate waste oil at what is now the Geiger (C&M Oil) site. Between 1969 and 1971, eight unlined lagoons, each approximately 1 ft deep and combined, covered an area approximately 1 ½ acres in size, were constructed for the purpose of holding waste oil in connection with the incineration process. In late 1971, in response to complaints from area residents, SCPCA ordered that all incineration and waste deposition activities at the site be

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stopped and the owner take action to prevent spillage, leakage, or seepage of oil from the site. In April 1974, a complaint was filed by a nearby property owner with the Charleston County Health Department (CCHD) about oil overflowing from the lagoons on the site. CCHD investigated and ordered the site closed, citing evidence of recent oil dumping and overflowing oil. C&M Oil Distributors, Inc. (C&M Oil) then purchased all reclaimable oil on the site and submitted recovery plans to the South Carolina Department of Health and Environmental Control (SCDHEC), but reportedly received no response to their plans.

In December 1979, SCDHEC requested C&M Oil to provide information on their plans for cleaning up the site. C&M Oil replied that they were unable to recover the waste oil and that they were not obligated to clean the site.

EPA Region IV began investigating the site in February 1980. Samples from two monitoring wells installed downgradient of the site contained organic compounds and metals that were also found in the waste pits. Residential wells upgradient of the site were sampled, but no organic compounds were detected. Metals in these residential samples were at background levels. Waste oil in the lagoons was found to contain chemicals similar to those associated with automotive crankcases, brake fluids, and degreasing compounds. The total quantity of waste on the site was estimated at 149,600 gal. The site was ranked using the Hazard Ranking System and received a score of 32.37.

The site was purchased in March 1982 by George Geiger. Mr. Geiger proposed excavation and disposal of contaminated soil in the lagoons, but approval was not given by SCDHEC. In 1983, Mr. Geiger filled the lagoons with local soils and used the area to store equipment for his company, Pile Drivers, Inc. At present, Mr. Geiger's daughter owns both the property and a portion of the company. The Geiger site was placed on the National Priorities List on September 8, 1983. A remedial investigation and feasibility study (RI/FS) of the site was completed in 1987. Low levels of organics as well as metals (primarily lead and chromium) were detected in the soils and the groundwater. Contaminants were not detected in groundwater samples collected from residential wells adjacent to the site.

A Potentially Responsible Party search conducted prior to the commencement of the Remedial Investigation/Feasibility Study (RI/FS) determined that there were no viable Potentially Responsible Parties. EPA, therefore conducted the RI/FS.

On June 1, 1987, EPA selected a remedial alternative, documented in the Record of Decision for the Geiger Site, in order to prevent direct contact exposure and inhalation of contaminants in the soil; potential ingestion of contaminated groundwater by on-site workers and potential future residents; prevent further leaching of contaminants to groundwater above drinking water standards, and to prevent potential direct contact exposure to environmental receptors. This alternative included:

- recovery of contaminated ground-water with on-site treatment and discharge to an off-site stream;

- on-site thermal treatment of excavated soils to remove organic contaminants;

- Solidification/Stabilization (S/S) of thermally-treated soil to reduce mobility of metals;

- During Remedial Design S/S would be reviewed to determine if S/S alone would achieve the remedial action goals; and

- During Remedial Design, soil cleanup goals would be developed.

The selected remedy established clean-up for contaminants in the groundwater based upon drinking water standards. The selected remedy eliminates the principal threat posed to human health and the environment by preventing further migration of contaminants to the groundwater and by remediating groundwater to drinking water standards.

Treatability studies were conducted during the Remedial Design phase which determined that S/S alone would remediate the contaminated soils. Based on these studies, the ROD was amended on July 13, 1993, stating that thermal treatment would not be conducted, only S/S.

In February 1992, EPA entered into a cooperative agreement with the Corps of Engineers (COE) to perform the Remedial Design/Remedial Action. After the final design was completed, the COE awarded the Remedial Action contract to McLaren/Hart Environmental Engineering Cooperation (McLaren/Hart) for Solidification/Stabilization of the soil. The company mobilized to the field for full scale treatment on January 16, 1994. Treatment was completed on April 23, 1994 followed by placement of a gravel cap over the treated soil, which was completed on August 5, 1994. The Pre-final inspection, conducted on August 9, 1994, did not discover any significant outstanding items and therefore served as the Final Inspection. Both the Final Construction Report and the Interim Remedial Action Report were approved by EPA and SCDHEC on September 29, 1997. Quality control analytical sampling of the treated soil, was conducted throughout the solidification activities. The QA/QC program used was rigorous and in conformance with EPA and State standards; therefore, EPA and the State determined that all analytical results were accurate to the degree needed to assure satisfactory execution of the RA and are consistent with the ROD and the RD plans and specifications.

EPA, since the signing of the ROD on June 1, 1987, has conducted additional field investigations in order to better characterize and define the extent of the groundwater contamination. The latest groundwater sample results, over the last several years, have indicated that there is no longer organic COCs in any monitoring wells, and lead has been the only inorganic COC consistently detected above drinking water standards, and in only two out of approximately 27 monitoring wells. Also, the level of lead has been decreasing in one of the two contaminated wells, and is near drinking water standards. The other monitoring well has had an increase in concentration, however, temporary monitoring wells located between the site and this monitoring well, did not show any detections of lead. In addition, this well is located in an undeveloped area. Thus, it does not appear that there is a definable "groundwater plume", but very localized contamination, and thus, the area of contamination is extensively smaller than originally thought. Because the soil has been treated to prevent further leaching of contamination to the groundwater, and because

additional sampling conducted by EPA shows there is only one remaining COC, consistently detected above drinking water standards in only two very small localized areas, one of which is near drinking water standards, EPA issued another ROD Amendment on September 9, 1998, changing the remedy from pump and treat to Monitored Natural Attenuation. EPA believes that this is the most cost-effective means of addressing the residual groundwater contamination. The Preliminary Close Out Report dated September 14, 1998 and the O & M Plan dated September 1998 were approved by the State of South Carolina.

2.0 DISCUSSION OF REMEDIAL OBJECTIVES

The remedial action objectives, as defined in the ROD and ROD Amendments, include the following: (1) eliminate or minimize the threat posed to public health and the environment from potential future exposure to hazardous substances in the soil and groundwater; and (2) restore contaminated groundwater to levels protective of human health and the environment.

2.1 ARAR Review

A review of current Federal and South Carolina drinking water regulations reveals the remedial goals for the contaminants of concern for groundwater, established in the ROD Amendment (September 1998), are the same as the current drinking water standards. These include remedial goals for the following contaminants of concern: lead (15 ug/l) and cadmium (5 ug/l).

2.2 Summary of Site Conditions

Since the completion of the S/S for soils (1994), there have been several groundwater sampling events. These groundwater sample results, over the last several years, have indicated that there is no organic COCs in any monitoring wells, and lead has been the only inorganic COC consistently detected above drinking water standards, and in only two out of approximately 27 monitoring wells. Also, the level of lead has been decreasing in one of the two contaminated wells, and is near drinking water standards. The other monitoring well has had an increase in concentration, however, temporary monitoring wells located between the site and this monitoring well, did not show any detections of lead. In addition, this well is located in an undeveloped area. Thus, it does not appear that there is a definable "groundwater plume", but very localized contamination, and thus, the area of contamination is extensively smaller than originally thought. Therefore, a ROD Amendment was signed which selected Monitored Natural Attenuation as the groundwater remedy. Two additional monitoring wells are to be installed next year and they, along with other wells, will be sampled regularly beginning in 1999. This will continue until all the remedial goals for all contaminants are achieved.

2.3 Areas of Non-compliance

There are two areas of non-compliance, not near each other as described above, in which the groundwater exceeds the remedial goals. These are localized areas of contamination and does not constitute a definable "groundwater plume." The one area has only lead near its drinking water

standard, in which the level has been decreasing over the years, and the other area has lead at 240 ug/l, though it has been increasing, as well as on occasion cadmium detection near or just above its drinking water standard.

3.0 RECOMMENDATIONS

Based upon the analytical data generated over the last several years, it is recommended that additional groundwater sampling, as described in the latest ROD Amendment (September 1998), be performed. This includes sampling all of the monitoring wells during the first sampling event, and if there is no contaminants detected in the medium to deep wells, then only the shallow wells will continue to be sampled. The wells will be sampled twice per year for the first two years and then once a year for the next three years.

4.0 STATEMENT OF PROTECTIVENESS

As discussed above, the Remedial Action at the Geiger Site as prescribed in the ROD for soils is completed. The latest Rod Amendment (1998) for groundwater is currently underway. Concentrations of most of the groundwater contaminants remain below the remedial goals in most of the monitoring wells; all but two of the wells. Since the overall level of groundwater contamination has been decreasing since the signing of the original ROD in 1987, it is believed that the Remedial Action at this Site is protective of human health and the environment.

5.0 NEXT FIVE-YEAR REVIEW

Since ongoing remedial action has not achieved the cleanup standards set forth in the latest ROD (1998) for all the groundwater, EPA guidance mandates that another five-year review will be conducted to evaluate the Site's status. Therefore, it will be necessary to re-evaluate the effectiveness of the remedy by October 2003.

for Richard D. Green, Director
Waste Management Division, Region IV

10/22/98
Date